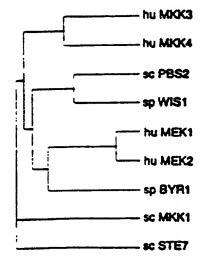
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FIG. 1



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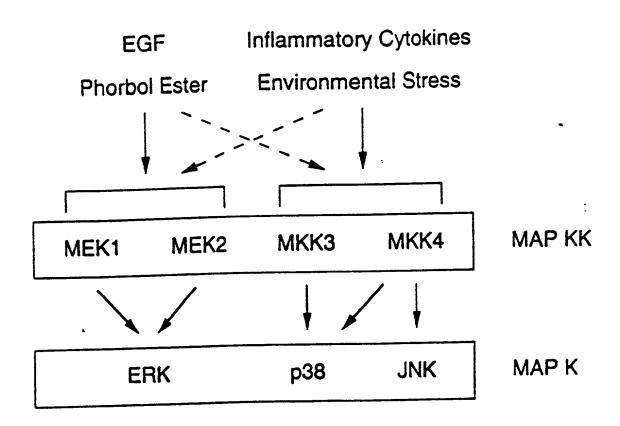


FIG.3

TGGCTGGCAA TGGCCTTGCT GACCTCGAGC CGGGCCCACG TGGGGACCTT TGGAGCACAG ACCGACCGTT ACCGGAACGA CTGGAGCTCG GCCCGGGTGC ACCCCTGGAA ACCTCGTGTC CCTACGATCC TGGTGCAAGG CCGGTGGATG CAGAGGCCAG TCCATATACC ACCCAGGCCT GGATGCTAGG ACCACGTTCC GGCCACCTAC GTCTCCGGTC AGGTATATGG TGGGTCCGGA 145 150 155 160 165 170 135 140 GCGAGGAGCG TGGTCCCCAC CCATCCAGCC CATATGTGCA AGTGCCCTTG ACAGAGAGGC CCCTCCTCGC ACCAGGGGTG GGTAGGTCGG GTATACACGT TCACGGGAAC TGTCTCTCCG 205 210 215 220 225 230 TGGTCATATC CATGGTGACC ATTTATGGGC CACAACAGGT CCCCATCTGC GCAGTGAACC ACCAGTATAG GTACCACTGG TAAATACCCG GTGTTGTCCA GGGGTAGACG CGTCACTTGG 285 290 295 300 265 270 275 280 255 260 CTGTGCTGAG CACCTTGCAG ACGTGATCTT GCTTCGTCCT GCAGCACTGT GCGGGGCAGG GACACGACTC GTGGAACGTC TGCACTAGAA CGAAGCAGGA CGTCGTGACA CGCCCCGTCC 315 320 325- 330 AAAATCCAAG AGGAAGAAGG ATCTACGGAT ATCCTGC ATG TCC AAG CCA CCC GCA TTTTAGGTTC TCCTTCTTCC TAGATGCCTA TAGGACG TAC AGG TTC GGT GGG CGT Met Ser Lys Pro Pro Ala> CCC AAC CCC ACA CCC CCC CGG AAC CTG GAC TCC CGG ACC TTC ATC ACC GGG TTG GGG TGT GGG GGG GCC TTG GAC CTG AGG GCC TGG AAG TAG TGG Pro Asn Pro Thr Pro Pro Arg Asn Leu Asp Ser Arg Thr Phe Ile Thr> ATT GGA GAC AGA AAC TTT GAG GTG GAG GCT GAT GAC TTG GTG ACC ATC TAA CCT CTG TCT TTG AAA CTC CAC CTC CGA CTA CTG AAC CAC TGG TAG Ile Gly Asp Arg Asn Phe Glu Val Glu Ala Asp Asp Leu Val Thr Ile> TCA GAA CTG GGC CGT GGA GCC TAT GGG GTG GTA GAG AAG GTG CGG CAC AGT CTT GAC CCG GCA CCT CGG ATA CCC CAC CAT CTC TTC CAC GCC GTG Ser Glu Leu Gly Arg Gly Ala Tyr Gly Val Val Glu Lys Val Arg His> GCC CAG AGC GGC ACC ATC ATG GCC GTG AAG CGG ATC CGG GCC ACC GTG CGG GTC TCG CCG TGG TAG TAC CGG CAC TTC GCC TAG GCC CGG TGG CAC Ala Gln Ser Gly Thr Ile Met Ala Val Lys Arg Ile Arg Ala Thr Val> AAC TCA CAG GAG CAG AAG CGG CTG CTC ATG GAC CTG GAC ATC AAC ATG TTG AGT GTC CTC GTC TTC GCC GAC GAG TAC CTG GAC CTG TAG TTG TAC Asn Ser Gln Glu Gln Lys Arg Leu Leu Met Asp Leu Asp Ile Asn Met>

1085 1090

1100 1105

1115 1120

FIG. 4 - CONT D

CGC ACG GTC GAC TGT TTC TAC ACT GTC ACC TTC TAC GGG GCA CTA TTC GCG TGC CAG CTG ACA AAG ATG TGA CAG TGG AAG ATG CCC CGT GAT AAG Arg Thr Val Asp Cys Phe Tyr Thr Val Thr Phe Tyr Gly Ala Leu Phe> AGA GAG GGA GAC GTG TGG ATC TGC ATG GAG CTC ATG GAC ACA TCC TTG TCT CTC CCT CTG CAC ACC TAG ACG TAC CTC GAG TAC CTG TGT AGG AAC Arg Glu Gly Asp Val Trp Ile Cys Met Glu Leu Met Asp Thr Ser Leu> GAC AAG TTC TAC CGG AAG GTG CTG GAT AAA AAC ATG ACA ATT CCA GAG CTG TTC AAG ATG GCC TTC CAC GAC CTA TTT TTG TAC TGT TAA GGT CTC Asp Lys Phe Tyr Arg Lys Val Leu Asp Lys Asn Met Thr Ile Pro Glu> 755 760 GAC ATC CTT GGG GAG ATT GCT GTG TCT ATC GTG CGG GCC CTG GAG CAT CTG TAG GAA CCC CTC TAA CGA CAC AGA TAG CAC GCC CGG GAC CTC GTA Asp Ile Leu Gly Glu Ile Ala Val Ser Ile Val Arg Ala Leu Glu His> 805 810 815 820 CTG CAC AGC AAG CTG TCG GTG ATC CAC AGA GAT GTG AAG CCC TCC AAT GAC GTG TCG TTC GAC AGC CAC TAG GTG TCT CTA CAC TTC GGG AGG TTA Leu His Ser Lys Leu Ser Val Ile His Arg Asp Val Lys Pro Ser Asn> 845 850 855 860 GTC CTT ATC AAC AAG GAG GGC CAT GTG AAG ATG TGT GAC TTT GGC ATC CAG GAA TAG TTG TTC CTC CCG GTA CAC TTC TAC ACA CTG AAA CCG TAG Val Leu Ile Asn Lys Glu Gly His Val Lys Met Cys Asp Phe Gly Ile> AGT GGC TAC TTG GTG GAC TCT GTG GCC AAG ACG ATG GAT GCC GGC TGC TCA CCG ATG AAC CAC CTG AGA CAC CGG TTC TGC TAC CTA CGG CCG ACG Ser Gly Tyr Leu Val Asp Ser Val Ala Lys Thr Met Asp Ala Gly Cys> AAG CCC TAC ATG GCC CCT GAG AGG ATC AAC CCA GAG CTG AAC CAG AAG TTC GGG ATG TAC CGG GGA CTC TCC TAG TTG GGT CTC GAC TTG GTC TTC Lys Pro Tyr Met Ala Pro Glu Arg Ile Asn Pro Glu Leu Asn Gln Lys> 995 1000 1010 1015 GGC TAC AAT GTC AAG TCC GAC GTC TGG AGC CTG GGC ATC ACC ATG ATT CCG ATG TTA CAG TTC AGG CTG CAG ACC TCG GAC CCG TAG TGG TAC TAA Gly Tyr Asn Val Lys Ser Asp Val Trp Ser Leu Gly Ile Thr Met Ile> 1040 1045 1055 1060 1070 1075 GAG ATG GCC ATC CTG CGG TTC CCT TAC GAG TCC TGG GGG ACC CCG TTC CTC TAC CGG TAG GAC GCC AAG GGA ATG CTC AGG ACC CCC TGG GGC AAG Glu Met Ala Ile Leu Arg Phe Pro Tyr Glu Ser Trp Gly Thr Pro Phe>

CAG CAG CTG AAG CAG GTG GTG GAG GAG CCG TCC CCC CAG CTC CCA GCC GTC GTC GAC TTC GTC CAC CAC CTC CTC GGC AGG GGG GTC GAG GGT CGG Gln Gln Leu Lys Gln Val Val Glu Glu Pro Ser Pro Gln Leu Pro Ala> 1145 1150 1130 1135 1140 1155 1160 1165 1170 1125 GAC CGT TTC TCC CCC GAG TTT GTG GAC TTC ACT GCT CAG TGC CTG AGG CTG GCA AAG AGG GGG CTC AAA CAC CTG AAG TGA CGA GTC ACG GAC TCC Asp Arg Phe Ser Pro Glu Phe Val Asp Phe Thr Ala Gln Cys Leu Arg> 1190 1195 1175 1180 1185 1200 1205 1210 1215 AAG AAC CCC GCA GAG CGT ATG AGC TAC CTG GAG CTG ATG GAG CAC CCC TTC TTG GGG CGT CTC GCA TAC TCG ATG GAC CTC GAC TAC CTC GTG GGG Lys Asn Pro Ala Glu Arg Met Ser Tyr Leu Glu Leu Met Glu His Pro> 1245 1250 1255 1260 1265 1235 1240 1220 1225 1230 TTC TTC ACC TTG CAC AAA ACC AAG AAG ACG GAC ATT GCT GCC TTC GTG AAG AAG TGG AAC GTG TTT TGG TTC TTC TGC CTG TAA CGA CGG AAG CAC. Phe Phe Thr Leu His Lys Thr Lys Lys Thr Asp Ile Ala Ala Phe Val> 1280 1285 1290 1295 1300 1305 1310 1315 1320 1270 1275 AAG AAG ATC CTG GGA GAA GAC TCA TAGGGGCTG GGCCTCGGAC CCCACTCCGG TTC TTC TAG GAC CCT CTT CTG AGT ATCCCCGAC CCGGAGCCTG GGGTGAGGCC Lys Lys Ile Leu Gly Glu Asp Ser> (SEO ID NO:2) 1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 1375 1380 CCCTCCAGAG CCCCACAGCC CCATCTGCGG GGGCAGTGCT CACCCACACC ATAAGCTACT GGGAGGTCTC GGGGTGTCGG GGTAGACGCC CCCGTCACGA GTGGGTGTGG TATTCGATGA 1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 1435 1440 GCCATCCTGG CCCAGGGCAT CTGGGAGGAA CCGAGGGGGC TGCTCCCACC TGGCTCTGTG CGGTAGGACC GGGTCCCGTA GACCCTCCTT GGCTCCCCCG ACGAGGGTGG ACCGAGACAC 1445 1450 1455 1460 1465 1470 1475 1480 1485 1490 1495 1500 GCGAGCCATT TGTCCCAAGT GCCAAAGAAG CAGACCATTG GGGCTCCCAG CCAGGCCCTT CGCTCGGTAA ACAGGGTTCA CGGTTTCTTC GTCTGGTAAC CCCGAGGGTC GGTCCGGGAA 1505 1510 1515 1520 1525 1530 1535 1540 1545 1550 1555 1560 GTCGGCCCCA CCAGTGCCTC TCCCTGCTGC TCCTAGGACC CGTCTCCAGC TGCTGAGATC CAGCCGGGGT GGTCACGGAG AGGACGACG AGGATCCTGG GCAGAGGTCG ACGACTCTAG 1565 1570 1575 1580 1585 1590 1595 1600 1605 1610 1615 1620 CTGGACTGAG GGGGCCTGGA TGCCCCCTGT GGATGCTGCT GCCCCTGCAC AGCAGGCTGC GACCTGACTC CCCCGGACCT ACGGGGGACA CCTACGACGA CGGGGACGTG TCGTCCGACG 1675 1680 1625 1630 1635 1640 1645 1650 1655 1660 1665 1670 CAGTGCCTGG GTGGATGGGC CACCGCCTTG CCCAGCCTGG ATGCCATCCA AGTTGTATAT GTCACGGACC CACCTACCCG GTGGCGGAAC GGGTCGGACC TACGGTAGGT TCAACATATA 1685 1690 1695 1700 1705 1710 1715 1720 1725 1730 1735 1740

TTTTTTAATC TCTCGACTGA ATGGACTTTG CACACTTTGG CCCAGGGTGG CCACACCTCT

AAAAAATTAG AGAGCTGACT TACCTGAAAC GTGTGAAACC GGGTCCCACC GGTGTGGAGA 1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795 1800 ATCCCGGCTT TGGTGCGGGG TACACAAGAG GGGATGAGTT GTGTGAATAC CCCAAGACTC TAGGGCCGAA ACCACGCCCC ATGTGTTCTC CCCTACTCAA CACACTTATG GGGTTCTGAG 1805 1810 1815 1820 1825 1830 1835 1840 1845 1850 1855 1860 CCATGAGGA GATGCCATGA GCCGCCCAAG GCCTTCCCCT GGCACTGGCA AACAGGGCCT GGTACTCCCT CTACGGTACT CGGCGGGTTC CGGAAGGGGA CCGTGACCGT TTGTCCCGGA 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 CTGCGGAGCA CACTGGCTCA CCCAGTCCTG CCCGCCACCG TTATCGGTGT CATTCACCTT GACGCCTCGT GTGACCGAGT GGGTCAGGAC GGGCGGTGGC AATAGCCACA GTAAGTGGAA 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 TCGTGTTTT TTTAATTTAT CCTCTGTTGA TTTTTTCTTT TGCTTTATGG GTTTGGCTTG AGCACAAAAA AAATTAAATA GGAGACAACT AAAAAAGAAA ACGAAATACC CAAACCGAAC 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 TTTTTCTTGC ATGGTTTGGA GCTGATCGCT TCTCCCCCAC CCCCTAGGGG (SEQ ID NO: 1) AAAAAGAACG TACCAAACCT CGACTAGCGA AGAGGGGGTG GGGGATCCCC

TAGCTGCAGC ACAGCCTTCC CTAACGTTGC AACTGGGGGA AAAATCACTT TCCAGTCTGT ATCGACGTCG TGTCGGAAGG GATTGCAACG TTGACCCCCT TTTTAGTGAA AGGTCAGACA 115 120 95 100 TTTGCAAGGT GTGCATTTCC ATCTTGATTC CCTGAAAGTC CATCTGCTGC ATCGGTCAAG AAACGTTCCA CACGTAAAGG TAGAACTAAG GGACTTTCAG GTAGACGACG TAGCCAGTTC 165 170 155 160 135 140 145 150 AGAAACTCCA CTTGCATGAA GATTGCACGC CTGCAGCTTG CATCTTTGTT GCAAAACTAG TCTTTGAGGT GAACGTACTT CTAACGTGCG GACGTCGAAC GTAGAAACAA CGTTTTGATC 225 230 235 240 215 220 205 210 195 200 CTACAGAAGA GAAGCAAGGC AAAGTCTTTT GTGCTCCCCT CCCCCATCAA AGGAAAGGGG GATGTCTTCT CTTCGTTCCG TTTCAGAAAA CACGAGGGGA GGGGGTAGTT TCCTTTCCCC 275 / AAA ATG TCT CAG TCG AAA GGC AAG AAG CGA AAC CCT GGC CTT AAA ATT TTT TAC AGA GTC AGC TTT CCG TTC TTC GCT TTG GGA CCG GAA TTT TAA Met Ser Gln Ser Lys Gly Lys Lys Arg Asn Pro Gly Leu Lys Ile> CCA AAA GAA GCA TTT GAA CAA CCT CAG ACC AGT TCC ACA CCA CCT AGA GGT TTT CTT CGT AAA CTT GTT GGA GTC TCG TCA AGG TGT GGT GGA TCT Pro Lys Glu Ala Phe Glu Gln Pro Gln Thr Ser Ser Thr Pro Pro Arg> *340 GAT TTA GAC TCC AAG GCT TGC ATT TCT ATT GGA AAT CAG AAC TTT GAG CTA AAT CTG AGG TTC CGA ACG TAA AGA TAA CCT TTA GTC TTG AAA CTC Asp Leu Asp Ser Lys Ala Cys Ile Ser Ile Gly Asn Gln Asn Phe Glu> GTG AAG GCA GAT GAC CTG GAG CCT ATA ATG GAA CTG GGA CGA GGT GCG CAC TTC CGT CTA CTG GAC CTC GGA TAT TAC CTT GAC CCT GCT CCA CGC Val Lys Ala Asp Asp Leu Glu Pro Ile Met Glu Leu Gly Arg Gly Ala> TAC GGG GTG GTG GAG AAG ATG CGG CAC GTG CCC AGC GGG CAG ATC ATG ATG CCC CAC CAC CTC TTC TAC GCC GTG CAC GGG TCG CCC GTC TAG TAC Tyr Gly Val Val Glu Lys Met Arg His Val Pro Ser Gly Gln Ile Met> GCA GTG AAG CGG ATC CGA GCC ACA GTA AAT AGC CAG GAA CAG AAA CGG CGT CAC TTC GCC TAG GCT CGG TGT CAT TTA TCG GTC CTT GTC TTT GCC Ala Val Lys Arg Ile Arg Ala Thr Val Asn Ser Gln Glu Gln Lys Arg> CTA CTG ATG GAT TTG GAT ATT TCC ATG AGG ACG GTG GAC TGT CCA TTC GAT GAC TAC CTA AAC CTA TAA AGG TAC TCC TGC CAC CTG ACA GGT AAG

Leu Leu Met Asp Leu Asp Ile Ser Met Arg Thr Val Asp Cys Pro Phe> ACT GTC ACC TIT TAT GGC GCA CTG TIT CGG GAG GGT GAT GTG TGG ATC TGA CAG TGG AAA ATA CCG CGT GAC AAA GCC CTC CCA CTA CAC ACC TAG Thr Val Thr Phe Tyr Gly Ala Leu Phe Arg Glu Gly Asp Val Trp Ile> TGC ATG GAG CTC ATG GAT ACA TCA CTA GAT AAA TTC TAC AAA CAA GTT ACG TAC CTC GAG TAC CTA TGT AGT GAT CTA TTT AAG ATG TTT GTT CAA Cys Met Glu Leu Met Asp Thr Ser Leu Asp Lys Phe Tyr Lys Gln Val> ATT GAT AAA GGC CAG ACA ATT CCA GAG GAC ATC TTA GGG AAA ATA GCA TAA CTA TTT CCG GTC TGT TAA GGT CTC CTG TAG AAT CCC TTT TAT CGT Ile Asp Lys Gly Gln Thr Ile Pro Glu Asp Ile Leu Gly Lys Ile Ala> GTT TCT ATT GTA AAA GCA TTA GAA CAT TTA CAT AGT AAG CTG TCT GTC CAA AGA TAA CAT TTT CGT AAT CTT GTA AAT GTA TCA TTC GAC AGA CAG Val Ser Ile Val Lys Ala Leu Glu His Leu His Ser Lys Leu Ser Val> ATT CAC AGA GAC GTC AAG CCT TCT AAT GTA CTC ATC AAT GCT CTC GGT TAA GTG TCT CTG CAG TTC GGA AGA TTA CAT GAG TAG TTA CGA GAG CCA Ile His Arg Asp Val Lys Pro Ser Asn Val Leu Ile Asn Ala Leu Gly> CAA GTG AAG ATG TGC GAT TTT GGA ATC AGT GGC TAC TTG GTG GAC TCT GTT CAC TTC TAC ACG CTA AAA CCT TAG TCA CCG ATG AAC CAC CTG AGA Gln Val Lys Met Cys Asp Phe Gly Ile Ser Gly Tyr Leu Val Asp Ser> GTT GCT AAA ACA ATT GAT GCA GGT TGC AAA CCA TAC ATG GCC CCT GAA CAA CGA TIT TGT TAA CTA CGT CCA ACG TIT GGT ATG TAC CGG GGA CTT Val Ala Lys Thr Ile Asp Ala Gly Cys Lys Pro Tyr Met Ala Pro Glu> AGA ATA AAC CCA GAG CTC AAC CAG AAG GGA TAC AGT GTG AAG TCT GAC TCT TAT TTG GGT CTC GAG TTG GTC TTC CCT ATG TCA CAC TTC AGA CTG Arg Ile Asn Pro Glu Leu Asn Gln Lys Gly Tyr Ser Val Lys Ser Asp> 1000 1005 ATT TGG AGT CTG GGC ATC ACG ATG ATT GAG TTG GCC ATC CTT CGA TTT TAA ACC TCA GAC CCG TAG TGC TAC TAA CTC AAC CGG TAG GAA GCT AAA Ile Trp Ser Leu Gly Ile Thr Met Ile Glu Leu Ala Ile Leu Arg Phe> 1045 1050 1030 1035 1015 1020 CCC TAT GAT TCA TGG GGA ACT CCA TIT CAG CAG CTC AAA CAG GTG GTA GGG ATA CTA AGT ACC CCT TGA GGT AAA GTC GTC GAG TIT GTC CAC CAT

Pro Tyr Asp Ser Trp Gly Thr Pro Phe Gln Gln Leu Lys Gln Val Val>

FIG. 5 - CONT'D

1100 1070 1075 1080 1085 1090 1095 1060 1065 GAG GAG CCA TCG CCA CAA CTC CCA GCA GAC AAG TTC TCT GCA GAG TTT CTC CTC GGT AGC GGT GTT GAG GGT CGT CTG TTC AAG AGA CGT CTC AAA Glu Glu Pro Ser Pro Gln Leu Pro Ala Asp Lys Phe Ser Ala Glu Phe> 1120 1125 1130 1135 1140 1145 1150 1115 1105 1110 GTT GAC TTT ACC TCA CAG TGC TTA AAG AAG AAT TCC AAA GAA CGG CCT CAA CTG AAA TGG AGT GTC ACG AAT TTC TTC TTA AGG TTT CTT GCC GGA Val Asp Phe Thr Ser Gln Cys Leu Lys Lys Asn Ser Lys Glu Arg Pro> 1195 1200 1165 1170 1175 1180 1185 1190 1160 1155 ACA TAC CCA GAG CTA ATG CAA CAT CCA TTT TTC ACC CTA CAT GAA TCC TGT ATG GGT CTC GAT TAC GTT GTA GGT AAA AAG TGG GAT GTA CTT AGG Thr Tyr Pro Glu Leu Met Gln His Pro Phe Phe Thr Leu His Glu Ser> 1225 1230 1235 1240 1245 1250 1210 1215 1220 1205 AAA GGA ACA GAT GTG GCA TCT TTT GTA AAA CTG ATT CTT GGA GAC TAAAA TTT CCT TGT CTA CAC CGT AGA AAA CAT TTT GAC TAA GAA CCT CTG ATTTT Lys Gly Thr Asp Val Ala Ser Phe Val Lys Leu Ile Leu Gly Asp> (SEQ ID NO:4) 1255 1260 1265 1270 1275 1280 1285 1290 1295 1300 1305 1310 AGCAGTGGAC TTAATCGGTT GACCCTACTG TGGATTGGTG GGTTTCGGGG TGAAGCAAGT TCGTCACCTG AATTAGCCAA CTGGGATGAC ACCTAACCAC CCAAAGCCCC ACTTCGTTCA 1315 1320 1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 TCACTACAGC ATCAATAGAA AGTCATCTTT GAGATAATTT AACCCTGCCT CTCAGAGGGT AGTGATGTCG TAGTTATCTT TCAGTAGAAA CTCTATTAAA TTGGGACGGA GAGTCTCCCA 1375 1380 1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 TTTCTCTCCC AATTTCTTT TTACTCCCCC TCTTAAGGGG GCCTTGGAAT CTATAGTATA AAAGAGAGGG TTAAAAGAAA AATGAGGGGG AGAATTCCCC CGGAACCTTA GATATCATAT 1435 1440 1445 1450 1455 1460 1465 1470 1475 1480 1485 1490 GAATGAACTG TCTAGATGGA TGAATTATGA TAAAGGCTTA GGACTTCAAA AGGTGATTAA CTTACTIGAC AGATCTACCT ACTTAATACT ATTTCCGAAT CCTGAAGTTT TCCACTAATT 1495 1500 1505 1510 1515 1520 1525 1530 1535 1540 1545 1550 1555 1560 1565 1570 1575 1580 1585 1590 1595 1600 THEFTER TEPTETET TETTEFFET TETTEFFT TETTEFFT TE

CTAGGGTCCC CGGCGCCAGG CCACCCGGCC GTCAGCAGC ATG CAG GGT AAA CGC AAA GATCCCAGGG GCCGCGTCC GGTGGGCCGG CAGTCGTCG TAC GTC CCA TTT GCG TTT Met Gln Gly Lys Arg Lys> GCA CTG AAG TTG AAT TTT GCA AAT CCA CCT TTC AAA TCT ACA GCA AGG CGT GAC TTC AAC TTA AAA CGT TTA GGT GGA AAG TTT AGA TGT CGT TCC Ala Leu Lys Leu Asn Phe Ala Asn Pro Pro Phe Lys Ser Thr Ala Arg> TTT ACT CTG AAT CCC AAT CCT ACA GGA GTT CAA AAC CCA CAC ATA GAG AAA TGA GAC TTA GGG TTA GGA TGT CCT CAA GTT TTG GGT GTG TAT CTC Phe Thr Leu Asn Pro Asn Pro Thr Gly Val Gln Asn Pro His Ile Glu> AGA CTG AGA ACA CAC AGC ATT GAG TCA TCA GGA AAA CTG AAG ATC TCC TCT GAC TCT TGT GTG TCG TAA CTC AGT AGT CCT TTT GAC TTC TAG AGG Arg Leu Arg Thr His Ser Ile Glu Ser Ser Gly Lys Leu Lys Ile Ser> CCT GAA CAA CAC TGG GAT TTC ACT GCA GAG GAC TTG AAA GAC CTT GGA GGA CTT GTT GTG ACC CTA AAG TGA CGT CTC CTG AAC TTT CTG GAA CCT Pro Glu Gln His Trp Asp Phe Thr Ala Glu Asp Leu Lys Asp Leu Gly> GAA ATT GGA CGA GGA GCT TAT GGT TCT GTC AAC AAA ATG GTC CAC AAA CTT TAA CCT GCT CCT CGA ATA CCA AGA CAG TIG TTT TAC CAG GTG TTT Glu Ile Gly Arg Gly Ala Tyr Gly Ser Val Asn Lys Met Val His Lys> CCA AGT GGG CAA ATA ATG GCA GTT AAA AGA ATT CGG TCA ACA GTG GAT GGT TCA CCC GTT TAT TAC CGT CAA TIT TCT TAA GCC AGT TGT CAC CTA Pro Ser Gly Gln Ile Met Ala Val Lys Arg Ile Arg Ser Thr Val Asp> GAA AAA GAA CAA AAA CAA CTT CTT ATG GAT TTG GAT GTA GTA ATG CGG CTT TTT CTT GTT TTT GTT GAA GAA TAC CTA AAC CTA CAT CAT TAC GCC Glu Lys Glu Gln Lys Gln Leu Leu Met Asp Leu Asp Val Val Met Arg> AGT AGT GAT TGC CCA TAC ATT GTT CAG TTT TAT GGT GCA CTC TTC AGA TCA TCA CTA ACG GGT ATG TAA CAA GTC AAA ATA CCA CGT GAG AAG TCT Ser Ser Asp Cys Pro Tyr Ile Val Gln Phe Tyr Gly Ala Leu Phe Arg> GAG GGT GAC TGT TGG ATC TGT ATG GAA CTC ATG TCT ACC TCG TTT GAT CTC CCA CTG ACA ACC TAG ACA TAC CTT GAG TAC AGA TGG AGC AAA CTA

Glu Gly Asp Cys Trp Ile Cys Met Glu Leu Met Ser Thr Ser Phe Asp>

AAG TTT TAC AAA TAT GTA TAT AGT GTA TTA GAT GAT GTT ATT CCA GAA TTC AAA ATG TTT ATA CAT ATA TCA CAT AAT CTA CTA CAA TAA GGT CTT Lys Phe Tyr Lys Tyr Val Tyr Ser Val Leu Asp Asp Val Ile Pro Glu> GAA ATT TTA GGC AAA ATC ACT TTA GCA ACT GTG AAA GCA CTA AAC CAC CTT TAA AAT CCG TTT TAG TGA AAT CGT TGA CAC TTT CGT GAT TTG GTG Glu Ile Leu Gly Lys Ile Thr Leu Ala Thr Val Lys Ala Leu Asn His> TTA AAA GAA AAC TTG AAA ATT ATT CAC AGA GAT ATC AAA CCT TCC AAT AAT TTT CTT TTG AAC TTT TAA TAA GTG TCT CTA TAG TTT GGA AGG TTA Leu Lys Glu Asn Leu Lys Ile Ile His Arg Asp Ile Lys Pro Ser Asn> ATT CTT CTG GAC AGA AGT GGA AAT ATT AAG CTC TGT GAC TTC GGC ATC. TAA GAA GAC CTG TCT TCA CCT TTA TAA TTC GAG ACA CTG AAG CCG TAG Ile Leu Leu Asp Arg Ser Gly Asn Ile Lys Leu Cys Asp Phe Gly Ile> AGT GGA CAG CTT GTG GAC TCT ATT GCC AAG ACA AGA GAT GCT GGC TGT TCA CCT GTC GAA CAC CTG AGA TAA CGG TTC TGT TCT CTA CGA CCG ACA Ser Gly Gln Leu Val Asp Ser Ile Ala Lys Thr Arg Asp Ala Gly Cys> AGG CCA TAC ATG GCA CCT GAA AGA ATA GAC CCA AGC GCA TCA CGA CAA TCC GGT ATG TAC CGT GGA CTT TCT TAT CTG GGT TCG CGT AGT GCT GTT Arg Pro Tyr Met Ala Pro Glu Arg Ile Asp Pro Ser Ala Ser Arg Gln> GGA TAT GAT GTC CGC TCT GAT GTC TGG AGT TTG GGG ATC ACA TTG TAT CCT ATA CTA CAG GCG AGA CTA CAG ACC TCA AAC CCC TAG TGT AAC ATA Gly Tyr Asp Val Arg Ser Asp Val Trp Ser Leu Gly Ile Thr Leu Tyr> GAG TTG GCC ACA GGC CGA TTT CCT TAT CCA AAG TGG AAT AGT GTA TTT CTC AAC CGG TGT CCG GCT AAA GGA ATA GGT TTC ACC TTA TCA CAT AAA Glu Leu Ala Thr Gly Arg Phe Pro Tyr Pro Lys Trp Asn Ser Val Phe> GAT CAA CTA ACA CAA GTC GTG AAA GGA GAT CCT CCG CAG CTG AGT AAT CTA GTT GAT TGT GTT CAG CAC TTT CCT CTA GGA GGC GTC GAC TCA TTA Asp Gln Leu Thr Gln Val Val Lys Gly Asp Pro Pro Gln Leu Ser Asn> TCT GAG GAA AGG GAA TTC TCC CCG AGT TTC ATC AAC TTT GTC AAC TTG AGA CTC CTT TCC CTT AAG AGG GGC TCA AAG TAG TTG AAA CAG TTG AAC Ser Glu Glu Arg Glu Phe Ser Pro Ser Phe Ile Asn Phe Val Asn Leu>

TGC CTT ACG AAG GAT GAA TCC AAA AGG CCA AAG TAT AAA GAG CTT CTG ACG GAA TGC TTC CTA CTT AGG TTT TCC GGT TTC ATA TTT CTC GAA GAC Cys Leu Thr Lys Asp Glu Ser Lys Arg Pro Lys Tyr Lys Glu Leu Leu> 1030 1035 1040 1045 1050 1055 1060 1065 AAA CAT CCC TTT ATT TTG ATG TAT GAA GAA CGT GCC GTT GAG GTC GCA TIT GTA GGG AAA TAA AAC TAC ATA CTT CTT GCA CGG CAA CTC CAG CGT Lys His Pro Phe Ile Leu Met Tyr Glu Glu Arg Ala Val Glu Val Ala> 1075 1080 1085 1090 1095 1100 1070 1105 1110 TGC TAT GTT TGT AAA ATC CTG GAT CAA ATG CCA GCT ACT CCC AGC TCT ACG ATA CAA ACA TIT TAG GAC CTA GIT TAC GGT CGA TGA GGG TCG AGA Cys Tyr Val Cys Lys Ile Leu Asp Gln Met Pro Ala Thr Pro Ser Ser> 1130 1135 1140 1145 1150 1155 1160 1165 1170 1115 1120 1125 CCC ATG TAT GTC GAT TG ATATCGYTGC TACATCAGAC TCTAGAAAAA AGGGCTGAGA GGG TAC ATA CAG CTA AC TATAGCRACG ATGTAGTCTG AGATCTTTTT TCCCGACTCT Pro Met Tyr Val Asp> (SEQ ID NO:6) 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 1230 GGAAGCAAGA CGTAAAGAAT TTTCATCCCG TATCACAGTG TTTTTATTGC TCGCCCAGAC CCTTCGTTCT GCATTTCTTA AAAGTAGGGC ATAGTGTCAC AAAAATAACG AGCGGGTCTG 1235 1240 1245 1250 1255 1260 1265 1270 1275 1280 1285 1290 ACCATGTGCA ATAAGATTGG TGTTCGTTTC CATCATGTCT GTATACTCCT GTCACCTAGA TGGTACACGT TATTCTAACC ACAAGCAAAG GTAGTACAGA CATATGAGGA CAGTGGATCT 1295 1300 1305 1310 1315 1320 1325 1330 1335 1340 1345 1350 ACGTGCATCC TTGTAATACC TGATTGATCA CACAGTGTTA GTGCTGGTCA GAGAGACCTC TGCACGTAGG AACATTATGG ACTAACTAGT GTGTCACAAT CACGACCAGT CTCTCTGGAG 1355 1360 1365 1370 1375 1380 1385 1390 1395 1400 1405 1410 ATCCTGCTCT TTTGTGATGA ACATATTCAT GAAATGTGGA AGTCAGTACG ATCAAGTTGT TAGGACGAGA AAACACTACT TGTATAAGTA CTTTACACCT TCAGTCATGC TAGTTCAACA 1415 1420 1425 1430 1435 1440 1445 1450 1455 1460 1465 1470 TGACTGTGAT TAGATCACAT CITAAATTCA TITCTAGACT CAAAACCTGG AGATGCAGCT ACTGACACTA ATCTAGTGTA GAATTTAAGT AAAGATCTGA GTTTTGGACC TCTACGTCGA 1475 1480 1485 1490 1495 1500 1505 1510 1515 1520 1525 1530 ACTGGAATGG TGTTTTGTCA GACTTCCAAA TCCTGGAAGG ACACAGTGAT GAATGTACTA TGACCTTACC ACAAAACAGT CTGAAGGTTT AGGACCTTCC TGTGTCACTA CTTACATGAT 1535 1540 1545 1550 1555 1560 1565 1570 1575 1580 1585 1590 TATCTGAACA TAGAAACTCG GGCTTGAGTG AGAAGAGCTT GCACAGCCAA CGAGACACAT ATAGACTIGI ATCTITGAGC CCGAACTCAC TCTICTCGAA CGTGTCGGTT GCTCTGTGTA 1595 1600 1605 1610 1615 1620 1625 1630 1635 1640 1645 1650 TGCCTTCTGG AGCTGGGAGA CAAAGGAGGA ATTTACTTTC TTCACCAAGT GCAATAGATT

ACGGAAGACC TCGACCCTCT GTTTCCTCCT TAAATGAAAG AAGTGGTTCA CGTTATCTAA

1655 1660 1665 1670 1675 1680 1685 1690 1695 1700 1705 1710 ACTGATGTGA TATTCTGTTG CTTTACAGTT ACAGTTGATG TTTGGGGATC GATGTGCTCA TGACTACACT ATAAGACAAC GAAATGTCAA TGTCAACTAC AAACCCCTAG CTACACGAGT 1715 1720 1725 1730 1735 1740 1745 1750 1755 1760 1765 1770 GCCAAATTIC CTGTTTGAAA TATCATGTTA AATTAGAATG AATITATCTT TACCAAAAAC CGGTTTAAAG GACAACTTT ATAGTACAAT TTAATCTTAC TTAAATAGAA ATGGTTTTTG 1775 1780 1785 1790 1795 1800 1805 1810 1815 1820 1825 1830 CATGTTGCGT TCAAAGAGGT GAACATTAAA ATATAGAGAC AGGACAGAAT GTGTTCTTTT GTACAACGCA AGTTTCTCCA CTTGTAATTT TATATCTCTG TCCTGTCTTA CACAAGAAAA 1835 1840 1845 1850 1855 1860 1865 1870 1875 1880 1885 1890 CTCCTCTACC AGTCCTATTT TTCAATGGA AGACTCAGGA GTCTGCCACT TGTCAAAGAA GAGGAGATGG TCAGGATAAA AAGTTACCCT TCTGAGTCCT CAGACGGTGA ACAGTTTCTT 1895 1900 1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 GGTGCTGATC CTAAGAATTT TTCATTCTCA GAATTCGGTG TGCTGCCAAC TTGATGTTCC CCACGACTAG GATTCTTAAA AAGTAAGAGT CTTAAGCCAC ACGACGGTTG AACTACAAGG 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 ACCTGCCACA AACCACCAGG ACTGAAAGAA GAAAACAGTA CAGAAGGCAA AGTTTACAGA TEGACEGTET TIGGTEGTEC TGACTITETT CTTTTGTCAT GTCTTCCGTT TCAAATGTCT 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 TGTTTTTAAT TCTAGTATIT TATCTGGAAC AACTIGTAGC AGCTATATAT TTCCCCTTGG ACAAAAATTA AGATCATAAA ATAGACCTTG TTGAACATCG TCGATATATA AAGGGGAACC 2075 2080 2085 2090 2095 2100 2105 2110 2115 2120 2125 2130 TCCCAAGCCT GATACTITAG CCATCATAAC TCACTAACAG GGAGAAGTAG CTAGTAGCAA AGGGTTCGGA CTATGAAATC GGTAGTATTG AGTGATTGTC CCTCTTCATC GATCATCGTT 2135 2140 2145 2150 2155 2160 2165 2170 2175 2180 2185 2190 TGTGCCTTGA TTGATTAGAT AAAGATTTCT AGTAGGCAGC AAAAGACCAA ATCTCAGTTG ACACGGAACT AACTAATCTA TTTCTAAAGA TCATCCGTCG TTTTCTGGTT TAGAGTCAAC 2195 2200 2205 2210 2215 2220 2225 2230 2235 2240 2245 2250 TTTGCTTCTT GCCATCACTG GTCCAGGTCT TCAGTTTCCG AATCTCTTTC CCTTCCCCTG AAACGAAGAA CGGTAGTGAC CAGGTCCAGA AGTCAAAGGC TTAGAGAAAG GGAAGGGGAC 2255 2260 2265 2270 2275 2280 2285 2290 2295 2300 2305 2310 TGGTCTATTG TCGCTATGTG ACTTGCGCTT AATCCAATAT TTTGCCTTTT TTCTATATCA ACCAGATAAC AGCGATACAC TGAACGCGAA TTAGGTTATA AAACGGAAAA AAGATATAGT 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 AAAAACCTTT ACAGTTAGCA GGGATGTTCC TTACCGAGGA TTTTTAACCC CCAATCTCTC TTTTTGGAAA TGTCAATCGT CCCTACAAGG AATGGCTCCT AAAAATTGGG GGTTAGAGAG 2375 2380 2385 2390 2395 2400 2405 2410 2415 2420 2425 2430

ATAATCGCTA GTGTTTAAAA GGCTAAGAAT AGTGGGGCCC AACCGATGTG GTAGGTGATA TATTAGCGAT CACAAATTIT CCGATTCTTA TCACCCCGGG TTGGCTACAC CATCCACTAT 2435 2440 2445 2450 2455 2460 2465 2470 2475 2480 2485 2490 AAGAGGCATC TTTTCTAGAG ACACATTGGA CCAGATGAGG ATCCGAAACG GCAGCCTTTA TTCTCCGTAG AAAAGATCTC TGTGTAACCT GGTCTACTCC TAGGCTTTGC CGTCGGAAAT 2495 2500 2505 2510 2515 2520 2525 2530 2535 2540 2545 2550 CGTTCATCAC CTGCTAGAAC CTCTCGTAGT CCATCACCAT TTCTTGGCAT TGGAATTCTA GCAAGTAGTG GACGATCTTG GAGAGCATCA GGTAGTGGTA AAGAACCGTA ACCTTAAGAT 2555 2560 2565 2570 2575 2580 2585 2590 2595 2600 2605 2610 CTGGAAAAA ATACAAAAAG CAAAACAAAA CCCTCAGCAC TGTTACAAGA GGCCATTTAA GACCTITITI TATGTTITIC GTTTTGTTTT GGGAGTCGTG ACAATGTTCT CCGGTAAATT 2615 2620 2625 2630 2635 2640 2645 2650 2655 2660 2665 2670 GTATCTTGTG CTTCTTCACT TACCCATTAG CCAGGTTCTC ATTAGGTTTT GCTTGGGCCT CATAGAACAC GAAGAAGTGA ATGGGTAATC GGTCCAAGAG TAATCCAAAA CGAACCCGGA 2675 2680 2685 2690 2695 2700 2705 2710 2715 2720 2725 2730 CCCTGGCACT GAACCTTAGG CTTTGTATGA CAGTGAAGCA GCACTGTGAG TGGTTCAAGC GGGACCGTGA CTTGGAATCC GAAACATACT GTCACTTCGT CGTGACACTC ACCAAGTTCG 2735 2740 2745 2750 2755 2760 2765 2770 2775 2780 2785 2790 ACACTGGAAT ATAAAACAGT CATGGCCTGA GATGCAGGTG ATGCCATTAC AGAACCAAAT TGTGACCTTA TATTITGTCA GTACCGGACT CTACGTCCAC TACGGTAATG TCTTGGTTTA 2795 2800 2805 2810 2815 2820 2825 2830 2835 2840 2845 2850 CGTGGCACGT ATTGCTGTGT CTCCTCTCAG AGTGACAGTC ATAAATACTG TCAAACAATA GCACCGTGCA TAACGACACA GAGGAGAGTC TCACTGTCAG TATTTATGAC AGTTTGTTAT 2855 2860 2865 2870 2875 2880 2885 2890 2895 2900 2905 2910 AAGGGAGAAT GGTGCTGTTT AAAGTCACAT CCCTGTAAAT TGCAGAATTC AAAAGTGATT TTCCCTCTTA CCACGACAAA TTTCAGTGTA GGGACATTTA ACGTCTTAAG TTTTCACTAA 2915 2920 2925 2930 2935 2940 2945 2950 2955 2960 2965 2970 ATCTCTTIGA TCTACTTGCC TCATTTCCCT ATCTTCTCCC CCACGGTATC CTAAACTTTA TAGAGAAACT AGATGAACGG AGTAAAGGGA TAGAAGAGGG GGTGCCATAG GATTTGAAAT 2975 2980 2985 2990 2995 3000 3005 3010 3015 3020 3025 3030 GACTTCCCAC TGTTCTGAAA GGAGACATTG CTCTATGTCT GCCTTCGACC ACAGCAAGCC CTGAAGGGTG ACAAGACTTT CCTCTGTAAC GAGATACAGA CGGAAGCTGG TGTCGTTCGG 3035 3040 3045 3050 3055 3060 3065 3070 3075 3080 3085 3090 ATCATCCTCC ATTGCTCCCG GGGACTCAAG AGGAATCTGT TTCTCTGCTG TCAACTTCCC TAGTAGGAGG TAACGAGGC CCCTGAGTTC TCCTTAGACA AAGAGACGAC AGTTGAAGGG 3095 3100 3105 3110 3115 3120 3125 3130 3135 3140 3145 3150 ATCTGGCTCA GCATAGGGTC ACTITGCCAT TATGCAAATG GAGATAAAAG CAATTCTGGC TAGACCGAGT CGTATCCCAG TGAAACGGTA ATACGTTTAC CTCTATTTTC GTTAAGACCG

3155 3160 3165 3170 3175 3180 3185 3190 3195 3200 3205 3210 TGTCCAGGAG CTAATCTGAC CGTTCTATTG TGTGGATGAC CACATAAGAA GGCAATTTTA ACAGGTCCTC GATTAGACTG GCAAGATAAC ACACCTACTG GTGTATTCTT CCGTTAAAAT 3215 3220 3225 3230 3235 3240 3245 3250 3255 3260 3265 3270 GTGTATTAAT CATAGATTAT TATAAACTAT AAACTTAAGG GCAAGGAGTT TATTACAATG CACATAATTA GTATCTAATA ATATTTGATA TTTGAATTCC CGTTCCTCAA ATAATGTTAC 3275 3280 3285 3290 3295 3300 3305 3310 3315 3320 3325 3330 TATCTTTATT AAAACAAAAG GGTGTATAGT GTTCACAAAC TGTGAAAATA GTGTAAGAAC ATAGAAATAA TTTTGTTTTC CCACATATCA CAAGTGTTTG ACACTTTTAT CACATTCTTG 3335 3340 3345 3350 3355 3360 3365 3370 3375 3380 3385 3390 TGTACATTGT GAGCTCTGGT TATTTTTCTC TTGTACCATA GAAAAATGTA TAAAAATTAT ACATGTAACA CTCGAGACCA ATAAAAAGAG AACATGGTAT CTTTTTACAT ATTTTTAATA 3395 3400 3405 3410 3415 3420 3425 3430 3435 3440 3445 3450 CAAAAAGCTA ATGTGCAGGG ATATTGCCTT ATTTGTCTGT AAAAAATGGA GCTCAGTAAC GTTTTTCGAT TACACGTCCC TATAACGGAA TAAACAGACA TTTTTTACCT CGAGTCATTG 3455 3460 3465 3470 3475 3480 3485 3490 3495 ATAACTGCTT CTTGGAGCTT TGGAATATTT TATCCTGTAT TCTTGTTT (SEQ ID NO:5) TATTGACGAA GAACCTCGAA ACCTTATAAA ATAGGACATA AGAACAAA

CAACA ATG GCG GCT CCG AGC CCG AGC GGT GGC GGC AGC GGC ACC CCC GTTGT TAC CGC CGA GGC TCG GGC TCG CCA CCG CCG CCG TCG CCG TGG GGG Met Ala Ala Pro Ser Pro Ser Gly Gly Gly Ser Gly Thr Pro> GGC CCC GTA GGG TCC CCG GCG CCA GGC CAC CCG GCC GTC AGC AGC ATG CCG GGG CAT CCC AGG GGC CGC GGT CCG GTG GGC CGG CAG TCG TCG TAC Gly Pro Val Gly Ser Pro Ala Pro Gly His Pro Ala Val Ser Ser Met> 135 140 CAG GGT AAA CGC AAA GCA CTG AAG TTG AAT TTT GCA AAT CCA CCT TTC GTC CCA TTT GCG TTT CGT GAC TTC AAC TTA AAA CGT TTA GGT GGA AAG Gln Gly Lys Arg Lys Ala Leu Lys Leu Asn Phe Ala Asn Pro Pro Phe> AAA TCT ACA GCA AGG TTT ACT CTG AAT CCC AAT CCT ACA GGA GTT CAA TTT AGA TGT CGT TCC AAA TGA GAC TTA GGG TTA GGA TGT CCT CAA GTT Lys Ser Thr Ala Arg Phe Thr Leu Asn Pro Asn Pro Thr Gly Val Gln> AAC CCA CAC ATA GAG AGA CTG AGA ACA CAC AGC ATT GAG TCA TCA GGA TTG GGT GTG TAT CTC TCT GAC TCT TGT GTG TCG TAA CTC AGT AGT CCT Asn Pro His Ile Glu Arg Leu Arg Thr His Ser Ile Glu Ser Ser Gly> AAA CTG AAG ATC TCC CCT GAA CAA CAC TGG GAT TTC ACT GCA GAG GAC TTT GAC TTC TAG AGG GGA CTT GTT GTG ACC CTA AAG TGA CGT CTC CTG Lys Leu Lys Ile Ser Pro Glu Gln His Trp Asp Phe Thr Ala Glu Asp> TTG AAA GAC CTT GGA GAA ATT GGA CGA GGA GCT TAT GGT TCT GTC AAC AAC TIT CTG GAA CCT CTT TAA CCT GCT CCT CGA ATA CCA AGA CAG TTG Leu Lys Asp Leu Gly Glu Ile Gly Arg Gly Ala Tyr Gly Ser Val Asn> AAA ATG GTC CAC AAA CCA AGT GGG CAA ATA ATG GCA GTT AAA AGA ATT TTT TAC CAG GTG TTT GGT TCA CCC GTT TAT TAC CGT CAA TTT TCT TAA Lys Met Val His Lys Pro Ser Gly Gln Ile Met Ala Val Lys Arg Ile> CGG TCA ACA GTG GAT GAA AAA GAA CAA AAA CAA CTT CTT ATG GAT TTG GCC AGT TGT CAC CTA CTT TTT CTT GTT TTT GTT GAA GAA TAC CTA AAC Arg Ser Thr Val Asp Glu Lys Glu Gln Lys Gln Leu Leu Met Asp Leu> GAT GTA GTA ATG CGG AGT AGT GAT TGC CCA TAC ATT GTT CAG TTT TAT CTA CAT CAT TAC GCC TCA TCA CTA ACG GGT ATG TAA CAA GTC AAA ATA

Asp Val Val Met Arg Ser Ser Asp Cys Pro Tyr Ile Val Gln Phe Tyr>

GGT GCA CTC TTC AGA GAG GGT GAC TGT TGG ATC TGT ATG GAA CTC ATG CCA CGT GAG AAG TCT CTC CCA CTG ACA ACC TAG ACA TAC CTT GAG TAC Gly Ala Leu Phe Arg Glu Gly Asp Cys Trp Ile Cys Met Glu Leu Met> TCT ACC TCG TTT GAT AAG TTT TAC AAA TAT GTA TAT AGT GTA TTA GAT AGA TGG AGC AAA CTA TTC AAA ATG TTT ATA CAT ATA TCA CAT AAT CTA Ser Thr Ser Phe Asp Lys Phe Tyr Lys Tyr Val Tyr Ser Val Leu Asp> GAT GTT ATT CCA GAA GAA ATT TTA GGC AAA ATC ACT TTA GCA ACT GTG CTA CAA TAA GGT CTT CTT TAA AAT CCG TTT TAG TGA AAT CGT TGA CAC Asp Val Ile Pro Glu Glu Ile Leu Gly Lys Ile Thr Leu Ala Thr Val> AAA GCA CTA AAC CAC TTA AAA GAA AAC TTG AAA ATT ATT CAC AGA GAT TTT CGT GAT TTG GTG AAT TTT CTT TTG AAC TTT TAA TAA GTG TCT CTA Lys Ala Leu Asn His Leu Lys Glu Asn Leu Lys Ile Ile His Arg Asp> ATC AAA CCT TCC AAT ATT CTT CTG GAC AGA AGT GGA AAT ATT AAG CTC TAG TTT GGA AGG TTA TAA GAA GAC CTG TCT TCA CCT TTA TAA TTC GAG Ile Lys Pro Ser Asn Ile Leu Leu Asp Arg Ser Gly Asn Ile Lys Leu> TGT GAC TTC GGC ATC AGT GGA CAG CTT GTG GAC TCT ATT GCC AAG ACA ACA CTG AAG CCG TAG TCA CCT GTC GAA CAC CTG AGA TAA CGG TTC TGT Cys Asp Phe Gly Ile Ser Gly Gln Leu Val Asp Ser Ile Ala Lys Thr> AGA GAT GCT GGC TGT AGG CCA TAC ATG GCA CCT GAA AGA ATA GAC CCA TCT CTA CGA CCG ACA TCC GGT ATG TAC CGT GGA CTT TCT TAT CTG GGT Arg Asp Ala Gly Cys Arg Pro Tyr Met Ala Pro Glu Arg Ile Asp Pro> AGC GCA TCA CGA CAA GGA TAT GAT GTC CGC TCT GAT GTC TGG AGT TTG TCG CGT AGT GCT GTT CCT ATA CTA CAG GCG AGA CTA CAG ACC TCA AAC Ser Ala Ser Arg Gln Gly Tyr Asp Val Arg Ser Asp Val Trp Ser Leu> GGG ATC ACA TTG TAT GAG TTG GCC ACA GGC CGA TTT CCT TAT CCA AAG CCC TAG TGT AAC ATA CTC AAC CGG TGT CCG GCT AAA GGA ATA GGT TTC Gly Ile Thr Leu Tyr Glu Leu Ala Thr Gly Arg Phe Pro Tyr Pro Lys> TGG AAT AGT GTA TIT GAT CAA CTA ACA CAA GTC GTG AAA GGA GAT CCT ACC TTA TCA CAT AAA CTA GTT GAT TGT GTT CAG CAC TTT CCT CTA GGA Trp Asn Ser Val Phe Asp Gln Leu Thr Gln Val Val Lys Gly Asp Pro>

1005 1010

CGG CAG CTG AGT AAT TCT GAG GAA AGG GAA TTC TCC CCG AGT TTC ATC GGC GTC GAC TCA TTA AGA CTC CTT TCC CTT AAG AGG GGC TCA AAG TAG Pro Gln Leu Ser Asn Ser Glu Glu Arg Glu Phe Ser Pro Ser Phe Ile>

1015 1020 1025 1030 1035 1040 1045 1050 1055

AAC TTT GTC AAC TTG TGC CTT ACG AAG GAT GAA TCC AAA AGG CCA AAG TTG AAA CAG TTG AAC ACG GAA TGC TTC CTA CTT AGG TTT TCC GGT TTC Asn Phe Val Asn Leu Cys Leu Thr Lys Asp Glu Ser Lys Arg Pro Lys>

1060 1065 1070 1075 1080 1085 1090 1095 1100 1105

TAT AAA GAG CTT CTG AAA CAT CCC TTT ATT TTG ATG TAT GAA GAA CGT ATA TTT CTC GAA GAC TTT GTA GGG AAA TAA AAC TAC ATA CTT CTT GCA Tyr Lys Glu Leu Leu Lys His Pro Phe Ile Leu Met Tyr Glu Glu Arg>

1110 1115 1120 1125 1130 1135 1140 1145 1150

GCC GTT GAG GTC GCA TGC TAT GTT TGT AAA ATC CTG GAT CAA ATG CCA CGG CAA CTC CAG CGT ACG ATA CAA ACA TTT TAG GAC CTA GTT TAC GGT Ala Val Glu Val Ala Cys Tyr Val Cys Lys Ile Leu Asp Gln Met Pro>

1155 1160 1165 1170 1175 1180 1185 1190 1195 1200

GCT ACT CCC AGC TCT CCC ATG TAT GTC GAT TGATAT CGYTGCTACA CGA TGA GGG TCG AGA GGG TAC ATA CAG CTA ACTATA GCRACGATGT Ala Thr Pro Ser Ser Pro Met Tyr Val Asp> (SEQ ID NO:8)

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1265 1270 1275 1280 1285 1290 1295 1300 1305 1310 1315 1320

ACAGTGTTTT TATTGCTCGC CCAGACACCA TGTGCAATAA GATTGGTGTT CGTTTCCATC TGTCACAAAA ATAACGAGCG GGTCTGTGGT ACACGTTATT CTAACCACAA GCAAAGGTAG

1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 1375 1380

ATGTCTGTAT ACTCCTGTCA CCTAGAACGT GCATCCTTGT AATACCTGAT TGATCACACA TACAGACATA TGAGGACAGT GGATCTTGCA CGTAGGAACA TTATGGACTA ACTAGTGTGT

1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 1435 1440

GTGTTAGTGC TGGTCAGAGA GACCTCATCC TGCTCTTTTG TGATGAACAT ATTCATGAAA CACAATCACG ACCAGTCTCT CTGGAGTAGG ACGAGAAAAC ACTACTTGTA TAAGTACTTT

1445 1450 1455 1460 1465 1470 1475 1480 1485 1490 1495 1500

TGTGGAAGTC AGTACGATCA AGTTGTTGAC TGTGATTAGA TCACATCTTA AATTCATTTC ACACCTTCAG TCATGCTAGT TCAACAACTG ACACTAATCT AGTGTAGAAT TTAAGTAAAG

1505 1510 1515 1520 1525 1530 1535 1540 1545 1550 1555 1560

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1565 1570 1575 1580 1585 1590 1595 1600 1605 1610 1615 1620

GGAAGGACAC AGTGATGAAT GTACTATATC TGAACATAGA AACTCGGGCT TGAGTGAGAA CCTTCCTGTG TCACTACTTA CATGATATAG ACTTGTATCT TTGAGCCCGA ACTCACTCTT

1625 1630 1635 1640 1645 1650 1655 1660 1665 1670 1675 1680 GAGCTTGCAC AGCCAACGAG ACACATTGCC TTCTGGAGCT GGGAGACAAA GGAGGAATTT CTCGAACGTG TCGGTTGCTC TGTGTAACGG AAGACCTCGA CCCTCTGTTT CCTCCTTAAA 1685 1690 1695 1700 1705 1710 1715 1720 1725 1730 1735 1740 ACTITICTICA CCAAGIGCAA TAGATTACIG ATGIGATATI CIGITGCITT ACAGITACAG TGAAAGAAGT GGTTCACGTT ATCTAATGAC TACACTATAA GACAACGAAA TGTCAATGTC 1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795 1800 TTGATGTTTG GGGATCGATG TGCTCAGCCA AATTTCCTGT TTGAAATATC ATGTTAAATT AACTACAAAC CCCTAGCTAC ACGAGTCGGT TTAAAGGACA AACTTTATAG TACAATTTAA 1805 1810 1815 1820 1825 1830 1835 1840 1845 1850 1855 1860 AGAATGAATT TATCTTTACC AAAAACCATG TTGCGTTCAA AGAGGTGAAC ATTAAAATAT TCTTACTTAA ATAGAAATGG TTTTTGGTAC AACGCAAGTT TCTCCACTTG TAATTTTATA 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 AGAGACAGGA CAGAATGTGT TCTTTTCTCC TCTACCAGTC CTATTTTTCA ATGGGAAGAC TCTCTGTCCT GTCTTACACA AGAAAAGAG AGATGGTCAG GATAAAAAGT TACCCTTCTG 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 TCAGGAGTCT GCCACTTGTC AAAGAAGGTG CTGATCCTAA GAATTTTTCA TTCTCAGAAT AGTCCTCAGA CGGTGAACAG TTTCTTCCAC GACTAGGATT CTTAAAAAGT AAGAGTCTTA 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 TCGGTGTGCT GCCAACTIGA TGTTCCACCT GCCACAAACC ACCAGGACTG AAAGAAGAAA AGCCACACGA CGGTTGAACT ACAAGGTGGA CGGTGTTTGG TGGTCCTGAC TTTCTTCTTT 2045 2050 2055 2060 2065 2070 2075 2080 2085 2090 2095 2100 ACAGTACAGA AGGCAAAGTT TACAGATGTT TTTAATTCTA GTATTTTATC TGGAACAACT TGTCATGTCT TCCGTTTCAA ATGTCTACAA AAATTAAGAT CATAAAATAG ACCTTGTTGA 2105 2110 2115 2120 2125 2130 2135 2140 2145 2150 2155 2160 TGTAGCAGCT ATATATTICC CCTTGGTCCC AAGCCTGATA CTTTAGCCAT CATAACTCAC ACATCGTCGA TATATAAAGG GGAACCAGGG TTCGGACTAT GAAATCGGTA GTATTGAGTG 2165 2170 2175 2180 2185 2190 2195 2200 2205 2210 2215 2220 TAACAGGGAG AAGTAGCTAG TAGCAATGTG CCTTGATTGA TTAGATAAAG ATTTCTAGTA ATTGTCCCTC TTCATCGATC ATCGTTACAC GGAACTAACT AATCTATTTC TAAAGATCAT 2225 2230 2235 2240 2245 2250 2255 2260 2265 2270 2275 2280 GGCAGCAAAA GACCAAATCT CAGTTGTTTG CTTCTTGCCA TCACTGGTCC AGGTCTTCAG CCGTCGTTTT CTGGTTTAGA GTCAACAAAC GAAGAACGGT AGTGACCAGG TCCAGAAGTC 2285 2290 2295 2300 2305 2310 2315 2320 2325 2330 2335 2340 TTTCCGAATC TCTTTCCCTT CCCCTGTGGT CTATTGTCGC TATGTGACTT GCGCTTAATC AAAGGCTTAG AGAAAGGGAA GGGGACACCA GATAACAGCG ATACACTGAA CGCGAATTAG 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400

CAATATTTTG CCTTTTTCT ATATCAAAAA ACCTTTACAG TTAGCAGGGA TGTTCCTTAC GTTATAAAAC GGAAAAAAGA TATAGTTTTT TGGAAATGTC AATCGTCCCT ACAAGGAATG 2405 2410 2415 2420 2425 2430 2435 2440 2445 2450 2455 2460 CGAGGATTTT TAACCCCCAA TCTCTCATAA TCGCTAGTGT TTAAAAGGCT AAGAATAGTG GCTCCTAAAA ATTGGGGGTT AGAGAGTATT AGCGATCACA AATTTTCCGA TTCTTATCAC 2465 2470 2475 2480 2485 2490 2495 2500 2505 2510 2515 2520 GGGCCCAACC GATGTGGTAG GTGATAAAGA GGCATCTTTT CTAGAGACAC ATTGGACCAG CCCGGGTTGG CTACACCATC CACTATTTCT CCGTAGAAAA GATCTCTGTG TAACCTGGTC 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 2580 ATGAGGATCC GAAACGGCAG CCTTTACGTT CATCACCTGC TAGAACCTCT CGTAGTCCAT TACTCCTAGG CTTTGCCGTC GGAAATGCAA GTAGTGGACG ATCTTGGAGA GCATCAGGTA 2585 2590 2595 2600 2605 2610 2615 2620 2625 2630 2635 2640 CACCATTTCT TGGCATTGGA ATTCTACTGG AAAAAAATAC AAAAAGCAAA ACAAAACCCT GTGGTAAAGA ACCGTAACCT TAAGATGACC TTTTTTTATG TTTTTCGTTT TGTTTTGGGA 2645 2650 2655 2660 2665 2670 2675 2680 2685 2690 2695 2700 CAGCACTGTT ACAAGAGGCC ATTTAAGTAT CTTGTGCTTC TTCACTTACC CATTAGCCAG GTCGTGACAA TGTTCTCCGG TAAATTCATA GAACACGAAG AAGTGAATGG GTAATCGGTC 2705 2710 2715 2720 2725 2730 2735 2740 2745 2750 2755 2760 GTTCTCATTA GGTTTTGCTT GGGCCTCCCT GGCACTGAAC CTTAGGCTTT GTATGACAGT CAAGAGTAAT CCAAAACGAA CCCGGAGGGA CCGTGACTTG GAATCCGAAA CATACTGTCA 2765 2770 2775 2780 2785 2790 2795 2800 2805 2810 2815 2820 GAAGCAGCAC TGTGAGTGGT TCAAGCACAC TGGAATATAA AACAGTCATG GCCTGAGATG CTTCGTCGTG ACACTCACCA AGTTCGTGTG ACCTTATATT TTGTCAGTAC CGGACTCTAC 2825 2830 2835 2840 2845 2850 2855 2860 2865 2870 2875 2880 CAGGTGATGC CATTACAGAA CCAAATCGTG GCACGTATTG CTGTGTCTCC TCTCAGAGTG GTCCACTACG GTAATGTCTT GGTTTAGCAC CGTGCATAAC GACACAGAGG AGAGTCTCAC 2885 2890 2895 2900 2905 2910 2915 2920 2925 2930 2935 2940 ACAGTCATAA ATACTGTCAA ACAATAAAGG GAGAATGGTG CTGTTTAAAG TCACATCCCT TGTCAGTATT TATGACAGTT TGTTATTTCC CTCTTACCAC GACAAATTTC AGTGTAGGGA 2945 2950 2955 2960 2965 2970 2975 2980 2985 2990 2995 3000 GTAAATTGCA GAATTCAAAA GTGATTATCT CTTTGATCTA CTTGCCTCAT TTCCCTATCT CATTTAACGT CTTAAGTTTT CACTAATAGA GAAACTAGAT GAACGGAGTA AAGGGATAGA 3005 3010 3015 3020 3025 3030 3035 3040 3045 3050 3055 3060 TCTCCCCAC GGTATCCTAA ACTTTAGACT TCCCACTGTT CTGAAAGGAG ACATTGCTCT AGAGGGGGTG CCATAGGATT TGAAATCTGA AGGGTGACAA GACTTTCCTC TGTAACGAGA 3065 3070 3075 3080 3085 3090 3095 3100 3105 3110 3115 3120 ATGTCTGCCT TCGACCACAG CAAGCCATCA TCCTCCATTG CTCCCGGGGA CTCAAGAGGA

TACAGACGGA AGCTGGTGTC GTTCGGTAGT AGGAGGTAAC GAGGGCCCCT GAGTTCTCCT 3125 3130 3135 3140 3145 3150 3155 3160 3165 3170 3175 3180 ATCTGTTTCT CTGCTGTCAA CTTCCCATCT GGCTCAGCAT AGGGTCACTT TGCCATTATG TAGACAAAGA GACGACAGTT GAAGGGTAGA CCGAGTCGTA TCCCAGTGAA ACGGTAATAC 3185 3190 3195 3200 3205 3210 3215 3220 3225 3230 3235 3240 CAAATGGAGA TAAAAGCAAT TCTGGCTGTC CAGGAGCTAA TCTGACCGTT CTATTGTGTG GTTTACCTCT ATTTTCGTTA AGACCGACAG GTCCTCGATT AGACTGGCAA GATAACACAC 3245 3250 3255 3260 3265 3270 3275 3280 3285 3290 3295 3300 GATGACCACA TAAGAAGGCA ATTTTAGTGT ATTAATCATA GATTATTATA AACTATAAAC CTACTGGTGT ATTCTTCCGT TAAAATCACA TAATTAGTAT CTAATAATAT TTGATATTTG 3305 3310 3315 3320 3325 3330 3335 3340 3345 3350 3355 3360 TTAAGGGCAA GGAGTTTATT ACAATGTATC TTTATTAAAA CAAAAGGGTG TATAGTGTTC AATTCCCGTT CCTCAAATAA TGTTACATAG AAATAATTTT GTTTTCCCAC ATATCACAAG 3365 3370 3375 3380 3385 3390 3395 3400 3405 3410 3415 3420 ACAAACTGTG AAAATAGTGT AAGAACTGTA CATTGTGAGC TCTGGTTATT TTTCTCTTGT TGTTTGACAC TTTTATCACA TTCTTGACAT GTAACACTCG AGACCAATAA AAAGAGAACA 3425 3430 3435 3440 3445 3450 3455 3460 3465 3470 3475 3480 ACCATAGAAA AATGTATAAA AATTATCAAA AAGCTAATGT GCAGGGATAT TGCCTTATTT TGGTATCTTT TTACATATTT TTAATAGTTT TTCGATTACA CGTCCCTATA ACGGAATAAA 3485 3490 3495 3500 3505 3510 3515 3520 3525 3530 3535 3540 GTCTGTAAAA AATGGAGCTC AGTAACATAA CTGCTTCTTG GAGCTTTGGA ATATTTTATC CAGACATTTT TTACCTCGAG TCATTGTATT GACGAAGAAC CTCGAAACCT TATAAAATAG 3545 3550

CTGTATTCTT GTTT (SEQ ID NO:7)
GACATAAGAA CAAA

CTCCCAACA ATG GCG GCT CCG AGC CCG AGC GGC GGC GGC TCC GGG GGC GAGGGTTGT TAC CGC CGA GGC TCG GGC TCG CCG CCG CCG AGG CCC CCG Met Ala Ala Pro Ser Pro Ser Gly Gly Gly Gly Ser Gly Gly> 70~ 75 GGC AGC GGC AGC GGC ACC CCC GGC CCC GTA GGG TCC CCG GCG CCA GGC CCG TCG CCG TCG CCG TGG GGG CCG GGG CAT CCC AGG GGC CGC GGT CCG Gly Ser Gly Ser Gly Thr Pro Gly Pro Val Gly Ser Pro Ala Pro Gly> CAC CCG GCC GTC AGC AGC ATG CAG GGT AAA CGC AAA GCA CTG AAG TTG GTG GGC CGG CAG TCG TCG TAC GTC CCA TTT GCG TTT CGT GAC TTC AAC His Pro Ala Val Ser Ser Met Gln Gly Lys Arg Lys Ala Leu Lys Leu> 190 195 AAT TTT GCA AAT CCA CCT TTC AAA TCT ACA GCA AGG TTT ACT CTG AAT TTA AAA CGT TTA GGT GGA AAG TTT AGA TGT CGT TCC AAA TGA GAC TTA Asn Phe Ala Asn Pro Pro Phe Lys Ser Thr Ala Arg Phe Thr Leu Asn> CCC AAT CCT ACA GGA GTT CAA AAC CCA CAC ATA GAG AGA CTG AGA ACA GGG TTA GGA TGT CCT CAA GTT TTG GGT GTG TAT CTC TCT GAC TCT TGT Pro Asn Pro Thr Gly Val Gln Asn Pro His Ile Glu Arg Leu Arg Thr> CAC AGC ATT GAG TCA TCA GGA AAA CTG AAG ATC TCC CCT GAA CAA CAC GTG TCG TAA CTC AGT AGT CCT TTT GAC TTC TAG AGG GGA CTT GTT GTG His Ser Ile Glu Ser Ser Gly Lys Leu Lys Ile Ser Pro Glu Gln His> TGG GAT TTC ACT GCA GAG GAC TTG AAA GAC CTT GGA GAA ATT GGA CGA ACC CTA AAG TGA CGT CTC CTG AAC TTT CTG GAA CCT CTT TAA CCT GCT Trp Asp Phe Thr Ala Glu Asp Leu Lys Asp Leu Gly Glu Ile Gly Arg> GGA GCT TAT GGT TCT GTC AAC AAA ATG GTC CAC AAA CCA AGT GGG CAA CCT CGA ATA CCA AGA CAG TTG TTT TAC CAG GTG TTT GGT TCA CCC GTT Gly Ala Tyr Gly Ser Val Asn Lys Met Val His Lys Pro Ser Gly Gln> ATA ATG GCA GTT AAA AGA ATT CGG TCA ACA GTG GAT GAA AAA GAA CAA TAT TAC CGT CAA TTT TCT TAA GCC AGT TGT CAC CTA CTT TTT CTT GTT Ile Met Ala Val Lys Arg Ile Arg Ser Thr Val Asp Glu Lys Glu Gln> AAA CAA CTT CTT ATG GAT TTG GAT GTA GTA ATG CGG AGT AGT GAT TGC TTT GTT GAA GAA TAC CTA AAC CTA CAT CAT TAC GCC TCA TCA CTA ACG Lys Gln Leu Leu Met Asp Leu Asp Val Val Met Arg Ser Ser Asp Cys>

CCA TAC ATT GTT CAG TTT TAT GGT GCA CTC TTC AGA GAG GGT GAC TGT GGT ATG TAA CAA GTC AAA ATA CCA CGT GAG AAG TCT CTC CCA CTG ACA Pro Tyr Ile Val Gln Phe Tyr Gly Ala Leu Phe Arg Glu Gly Asp Cys> TGG ATC TGT ATG GAA CTC ATG TCT ACC TCG TTT GAT AAG TTT TAC AAA ACC TAG ACA TAC CTT GAG TAC AGA TGG AGC AAA CTA TTC AAA ATG TTT Trp Ile Cys Met Glu Leu Met Ser Thr Ser Phe Asp Lys Phe Tyr Lys> TAT GTA TAT AGT GTA TTA GAT GAT GTT ATT CCA GAA GAA ATT TTA GGC ATA CAT ATA TCA CAT AAT CTA CTA CAA TAA GGT CTT CTT TAA AAT CCG Tyr Val Tyr Ser Val Leu Asp Asp Val Ile Pro Glu Glu Ile Leu Gly> AAA ATC ACT TTA GCA ACT GTG AAA GCA CTA AAC CAC TTA AAA GAA AAC TTT TAG TGA AAT CGT TGA CAC TTT CGT GAT TTG GTG AAT TTT CTT TTG Lys Ile Thr Leu Ala Thr Val Lys Ala Leu Asn His Leu Lys Glu Asn> TTG AAA ATT ATT CAC AGA GAT ATC AAA CCT TCC AAT ATT CTT CTG GAC AAC TTT TAA TAA GTG TCT CTA TAG TTT GGA AGG TTA TAA GAA GAC CTG Leu Lys Ile Ile His Arg Asp Ile Lys Pro Ser Asn Ile Leu Leu Asp> AGA AGT GGA AAT ATT AAG CTC TGT GAC TTC GGC ATC AGT GGA CAG CTT TCT TCA CCT TTA TAA TTC GAG ACA CTG AAG CCG TAG TCA CCT GTC GAA Arg. Ser Gly Asn Ile Lys Leu Cys Asp Phe Gly Ile Ser Gly Gln Leu> GTG GAC TCT ATT GCC AAG ACA AGA GAT GCT GGC TGT AGG CCA TAC ATG CAC CTG AGA TAA CGG TTC TGT TCT CTA CGA CCG ACA TCC GGT ATG TAC Val Asp Ser Ile Ala Lys Thr Arg Asp Ala Gly Cys Arg Pro Tyr Met> GCA CCT GAA AGA ATA GAC CCA AGC GCA TCA CGA CAA GGA TAT GAT GTC CGT GGA CTT TCT TAT CTG GGT TCG CGT AGT GCT GTT CCT ATA CTA CAG Ala Pro Glu Arg Ile Asp Pro Ser Ala Ser Arg Gln Gly Tyr Asp Val> CGC TCT GAT GTC TGG AGT TTG GGG ATC ACA TTG TAT GAG TTG GCC ACA GCG AGA CTA CAG ACC TCA AAC CCC TAG TGT AAC ATA CTC AAC CGG TGT Arg Ser Asp Val Trp Ser Leu Gly Ile Thr Leu Tyr Glu Leu Ala Thr> GGC CGA TIT CCT TAT CCA AAG TGG AAT AGT GTA TTT GAT CAA CTA ACA CCG GCT AAA GGA ATA GGT TTC ACC TTA TCA CAT AAA CTA GTT GAT TGT Gly Arg Phe Pro Tyr Pro Lys Trp Asn Ser Val Phe Asp Gln Leu Thr>

CAA GTC GTG AAA GGA GAT CCT CCG CAG CTG AGT AAT TCT GAG GAA AGG GTT CAG CAC TTT CCT CTA GGA GGC GTC GAC TCA TTA AGA CTC CTT TCC Gln Val Val Lys Gly Asp Pro Pro Gln Leu Ser Asn Ser Glu Glu Arg> 1030 1035 1045 1050 1025 1040 1055 1015 1020 GAA TTC TCC CCG AGT TTC ATC AAC TTT GTC AAC TTG TGC CTT ACG AAG CTT AAG AGG GGC TCA AAG TAG TTG AAA CAG TTG AAC ACG GAA TGC TTC Glu Phe Ser Pro Ser Phe Ile Asn Phe Val Asn Leu Cys Leu Thr Lys> 1090 1095 1100 1105 1075 1080 1085 1060 1065 1070 GAT GAA TCC AAA AGG CCA AAG TAT AAA GAG CTT CTG AAA CAT CCC TTT CTA CTT AGG TTT TCC GGT TTC ATA TTT CTC GAA GAC TTT GTA GGG AAA Asp Glu Ser Lys Arg Pro Lys Tyr Lys Glu Leu Leu Lys His Pro Phe> 1150 1155 1145 1120 1125 1130 1135 1140 1110 1115 ATT TTG ATG TAT GAA GAA CGT GCC GTT GAG GTC GCA TGC TAT GTT TGT TAA AAC TAC ATA CTT CTT GCA CGG CAA CTC CAG CGT ACG ATA CAA ACA Ile Leu Met Tyr Glu Glu Arg Ala Val Glu Val Ala Cys Tyr Val Cys≥ 1175 1180 1185 1190 1195 1200 1165 1170 1160 AAA ATC CTG GAT CAA ATG CCA GCT ACT CCC AGC TCT CCC ATG TAT GTC TTT TAG GAC CTA GTT TAC GGT CGA TGA GGG TCG AGA GGG TAC ATA CAG Lys Ile Leu Asp Gln Met Pro Ala Thr Pro Ser Ser Pro Met Tyr Val> 1205 1210 1215 1220 1225 1230 1235 1240 1245 1250 1255 1260 GAT TGAT ATCGCTGCTA CATCAGACTC TAGAAAAAAG GGCTGAGAGG AAGCAAGACG CTA ACTA TAGCGACGAT GTAGTCTGAG ATCTTTTTC CCGACTCTCC TTCGTTCTGC Asp> (SEQ ID NO:10) 1265 1270 1275 1280 1285 1290 1295 1300 1305 1310 1315 1320 TAAAGAATTT TCATCCCGTA TCACAGTGTT TTTATTGCTC GCCCAGACAC CATGTGCAAT ATTICTTAAA AGTAGGGCAT AGTGTCACAA AAATAACGAG CGGGTCTGTG GTACACGTTA 1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 1375 1380 AAGATTGGTG TTCGTTTCCA TCATGTCTGT ATACTCCTGT CACCTAGAAC GTGCATCCTT TTCTAACCAC AAGCAAAGGT AGTACAGACA TATGAGGACA GTGGATCTTG CACGTAGGAA 1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 1435 1440 GTAATACCTG ATTGATCACA CAGTGTTAGT GCTGGTCAGA GAGACCTCAT CCTGCTCTTT CATTATGGAC TAACTAGTGT GTCACAATCA CGACCAGTCT CTCTGGAGTA GGACGAGAAA 1445 1450 1455 1460 1465 1470 1475 1480 1485 1490 1495 1500 TGTGATGAAC ATATTCATGA AATGTGGAAG TCAGTACGAT CAAGTTGTTG ACTGTGATTA ACACTACTTG TATAAGTACT TTACACCTTC AGTCATGCTA GTTCAACAAC TGACACTAAT 1505 1510 1515 1520 1525 1530 1535 1540 1545 1550 1555 1560 GATCACATCT TAAATTCATT TCTAGACTCA AAACCTGGAG ATGCAGCTAC TGGAATGGTG CTAGTGTAGA ATTTAAGTAA AGATCTGAGT TTTGGACCTC TACGTCGATG ACCTTACCAC 1585 1590 1595 1600 1605 1610 1615 1620 1565 1570 1575 1580

TTTTGTCAGA CTTCCAAATC CTGGAAGGAC ACAGTGATGA ATGTACTATA TCTGAACATA

AAAACAGTCT GAAGGTTTAG GACCTTCCTG TGTCACTACT TACATGATAT AGACTTGTAT 1625 1630 1635 1640 1645 1650 1655 1660 1665 1670 1675 1680 GAAACTCGGG CTTGAGTGAG AAGAGCTTGC ACAGCCAACG AGACACATTG CCTTCTGGAG CTTTGAGCCC GAACTCACTC TTCTCGAACG TGTCGGTTGC TCTGTGTAAC GGAAGACCTC 1685 1690 1695 1700 1705 1710 1715 1720 1725 1730 1735 1740 CTGGGAGACA AAGGAGGAAT TTACTTTCTT CACCAAGTGC AATAGATTAC TGATGTGATA GACCCTCTGT TTCCTCCTTA AATGAAAGAA GTGGTTCACG TTATCTAATG ACTACACTAT 1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795 1800 TTCTGTTGCT TTACAGTTAC AGTTGATGTT TGGGGATCGA TGTGCTCAGC CAAATTTCCT AAGACAACGA AATGTCAATG TCAACTACAA ACCCCTAGCT ACACGAGTCG GTTTAAAGGA 1805 1810 1815 1820 1825 1830 1835 1840 1845 1850 1855 1860 GTTTGAAATA TCATGTTAAA TTAGAATGAA TTTATCTTTA CCAAAAACCA TGTTGCGTTC CAAACTTTAT AGTACAATTT AATCTTACTT AAATAGAAAT GGTTTTTGGT ACAACGCAAG 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 AAAGAGTGA ACATTAAAAT ATAGAGACAG GACAGAATGT GTTCTTTTCT CCTCTACCAG TTTCTCCACT TGTAATTTTA TATCTCTGTC CTGTCTTACA CAAGAAAAGA GGAGATGGTC 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 TCCTATTTT CAATGGGAAG ACTCAGGAGT CTGCCACTTG TCAAAGAAGG TGCTGATCCT AGGATAAAAA GTTACCCTTC TGAGTCCTCA GACGGTGAAC AGTTTCTTCC ACGACTAGGA 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 AAGAATTTTT CATTCTCAGA ATTCGGTGTG CTGCCAACTT GATGTTCCAC CTGCCACAAA TTCTTAAAAA GTAAGAGTCT TAAGCCACAC GACGGTTGAA CTACAAGGTG GACGGTGTTT 2045 2050 2055 2060 2065 2070 2075 2080 2085 2090 2095 2100 CCACCAGGAC TGAAAGAAGA AAACAGTACA GAAGGCAAAG TTTACAGATG TTTTTAATTC GGTGGTCCTG ACTITCTTCT TTTGTCATGT CTTCCGTTTC AAATGTCTAC AAAAATTAAG 2105 2110 2115 2120 2125 2130 2135 2140 2145 2150 2155 2160 TAGTATTTA TCTGGAACAA CTTGTAGCAG CTATATATTT CCCCTTGGTC CCAAGCCTGA ATCATAAAAT AGACCTTGTT GAACATCGTC GATATATAAA GGGGAACCAG GGTTCGGACT 2165 2170 2175 2180 2185 2190 2195 2200 2205 2210 2215 2220 TACTITAGCC ATCATAACTC ACTAACAGGG AGAAGTAGCT AGTAGCAATG TGCCTTGATT ATGAAATCGG TAGTATTGAG TGATTGTCCC TCTTCATCGA TCATCGTTAC ACGGAACTAA 2225 2230 2235 2240 2245 2250 2255 2260 2265 2270 2275 2280 GATTAGATAA AGATTTCTAG TAGGCAGCAA AAGACCAAAT CTCAGTTGTT TGCTTCTTGC CTAATCTATT TCTAAAGATC ATCCGTCGTT TTCTGGTTTA GAGTCAACAA ACGAAGAACG 2285 2290 2295 2300 2305 2310 2315 2320 2325 2330 2335 2340 CATCACTGGT CCAGGTCTTC AGTTTCCGAA TCTCTTTCCC TTCCCCTGTG GTCTATTGTC GTAGTGACCA GGTCCAGAAG TCAAAGGCTT AGAGAAAGGG AAGGGGACAC CAGATAACAG

2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 GCTATGTGAC TTGCGCTTAA TCCAATATTT TGCCTTTTTT CTATATCAAA AAACCTTTAC CGATACACTG AACGCGAATT AGGTTATAAA ACGGAAAAAA GATATAGTTT TTTCGAAATG 2405 2410 2415 2420 2425 2430 2435 2440 2445 2450 2455 2460 AGTTAGCAGG GATGTTCCTT ACCGAGGATT TTTAACCCCC AATCTCTCAT AATCGCTAGT TCAATCGTCC CTACAAGGAA TGGCTCCTAA AAATTGGGGG TTAGAGAGTA TTAGCGATCA 2465 2470 2475 2480 2485 2490 2495 2500 2505 2510 2515 2520 GTTTAAAAGG CTAAGAATAG TGGGGCCCAA CCGATGTGGT AGGTGATAAA GAGGCATCTT CAAATTTTCC GATTCTTATC ACCCCGGGTT GGCTACACCA TCCACTATTT CTCCGTAGAA 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 2580 TTCTAGAGAC ACATTGGACC AGATGAGGAT CCGAAACGGC AGCCTTTACG TTCATCACCT AAGATCTCTG TGTAACCTGG TCTACTCCTA GGCTTTGCCG TCGGAAATGC AAGTAGTGGA 2585 2590 2595 2600 2605 2610 2615 2620 2625 2630 2635 2640 GCTAGAACCT CTCGTAGTCC ATCACCATTT CTTGGCATTG GAATTCTACT GGAAAAAAAT CGATCTTGGA GAGCATCAGG TAGTGGTAAA GAACCGTAAC CTTAAGATGA CCTTTTTTTA 2645 2650 2655 2660 2665 2670 2675 2680 2685 2690 2695 2700 ACAAAAAGCA AAACAAAACC CTCAGCACTG TTACAAGAGG CCATTTAAGT ATCTTGTGCT TGTTTTCGT TTTGTTTTGG GAGTCGTGAC AATGTTCTCC GGTAAATTCA TAGAACACGA 2705 2710 2715 2720 2725 2730 2735 2740 2745 2750 2755 2760 TCTTCACTTA CCCATTAGCC AGGTTCTCAT TAGGTTTTGC TTGGGCCTCC CTGGCACTGA AGAAGTGAAT GGGTAATCGG TCCAAGAGTA ATCCAAAACG AACCCGGAGG GACCGTGACT 2765 2770 2775 2780 2785 2790 2795 2800 2805 2810 2815 2820 ACCTTAGGCT TTGTATGACA GTGAAGCAGC ACTGTGAGTG GTTCAAGCAC ACTGGAATAT TGGAATCCGA AACATACTGT CACTTCGTCG TGACACTCAC CAAGTTCGTG TGACCTTATA 2825 2830 2835 2840 2845 2850 2855 2860 2865 2870 2875 2880 AAAACAGTCA TGGCCTGAGA TGCAGGTGAT GCCATTACAG AACCAAATCG TGGCACGTAT TTTTGTCAGT ACCGGACTCT ACGTCCACTA CGGTAATGTC TTGGTTTAGC ACCGTGCATA 2885 2890 2895 2900 2905 2910 2915 2920 2925 2930 2935 2940 TECTGTGTCT CCTCTCAGAG TGACAGTCAT AAATACTGTC AAACAATAAA GGGAGAATGG ACGACACAGA GGAGAGTCTC ACTGTCAGTA TTTATGACAG TTTGTTATTT CCCTCTTACC 2945 2950 2955 2960 2965 2970 2975 2980 2985 2990 2995 3000 TGCTGTTTAA AGTCACATCC CTGTAAATTG CAGAATTCAA AAGTGATTAT CTCTTTGATC ACGACAAATT TCAGTGTAGG GACATTTAAC GTCTTAAGTT TTCACTAATA GAGAAACTAG 3005 3010 3015 3020 3025 3030 3035 3040 3045 3050 3055 3060 TACTTGCCTC ATTTCCCTAT CTTCTCCCCC ACGGTATCCT AAACTTTAGA CTTCCCACTG ATGAACGGAG TAAAGGGATA GAAGAGGGGG TGCCATAGGA TTTGAAATCT GAAGGGTGAC 3065 3070 3075 3080 3085 3090 3095 3100 3105 3110 3115 3120

FIG. 8 - CONT'D

TTCTGAAAGG AAGACTTTCC	AGACATTGCT TCTGTAACGA	CTATGTCTGC GATACAGACG	CTTCGACCAC GAAGCTGGTG	AGCAAGCCAT TCGTTCGGTA	CATCCTCCAT GTAGGAGGTA
3125 3130 *	3135 3140	3145 3150	3155 3160	3165 3170	3175 3180
TGCTCCCGGG ACGAGGGCCC	GACTEAAGAG CTGAGTTCTC	GAATCTGTTT CTTAGACAAA	CTCTGCTGTC GAGACGACAG	AACTTCCCAT TTGAAGGGTA	CTGGCTCAGC GACCGAGTCG
*	*	*	3215 3220 *	*	*
ATAGGGTCAC TATCCCAGTG	TTTGCCATTA AAACGGTAAT	TGCAAATGGA ACGTTTACCT	GATAAAAGCA CTATTTTCGT	ATTCTGGCTG TAAGACCGAC	TCCAGGAGCT AGGTCCTCGA
*	3255 3260 *	*	3275 3280 *	*	*
AATCTGACCG TTAGACTGGC	TTCTATTGTG AAGATAACAC	TGGATGACCA ACCTACTGGT	CATAAGAAGG GTATTCTTCC	CAATTITAGT GTTAAAATCA	GTATTAATCA CATAATTAGT
3305 3310	3315 3320 *	3325 3330 *	3335 3340	3345 3350 *	3355 3360
TAGATTATTA ATCTAATAAT	TAAACTATAA ATTTGATATT	ACTTAAGGGC TGAATTCCCG	AAGGAGTTTA TTCCTCAAAT	TTACAATGTA AATGTTACAT	TCTTTATTĄA AGAAATAATT
3365 3370 *	3375 3380 *	3385 3390 *	3395 3400 *	3405 3410	3415 3420 *
			TGAAAATAGT ACTTTTATCA		
3425 3430 *	3435 3440	3445 3450 *	3455 3460	3465 3470	3475 3480
			AAAATGTATA TTTTACATAT		
3485 3490	*	*	3515 3520 *	*	*
			AAAATGGAGC TTTTACCTCG		
*	3555 3560 *	*			
	GAATATTTTA CTTATAAAAT		TTGTTT (SE	Q ID NO:9)	